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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,083	03/01/2002	Farhad Farassat	MEISS69.001AUS	4257

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EXAMINER

KERNS, KEVIN P

ART UNIT	PAPER NUMBER
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1725

NOTIFICATION DATE	DELIVERY MODE
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07/26/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<p align="center">Office Action Summary</p>	<p>Application No.</p> <p align="center">10/090,083</p>	<p>Applicant(s)</p> <p align="center">FARASSAT, FARHAD</p>	
	<p>Examiner</p> <p align="center">Kevin P. Kerns</p>	<p>Art Unit</p> <p align="center">1725</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-16,18-21,23 and 27-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-16,18-21,23 and 27-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 4, 6-11, 21, 23, and 27-33 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 5 and 7-9 of U.S. Patent No. 5979737 in view of Zimmerman (USPN 4786860).

Although the conflicting claims are not identical, they are not patentably distinct from each other because both teach a wire bonder ('737 bonding head) comprising a bonding head, wire clamp ('737 claim 8), drive mechanism ('737 motor) and force measuring device associated with the clamp so that the force ('737 pressure) on the wire can be measured and converted (adjusted) into changes in bonding parameters ('737, pressure or displacement changes, claims 7-9). The clamp is mounted in a

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holder on the bondhead so that it can be linearly displaced and elastically deflected via a spring (instant claims 6, 7, 10, 27, 28 and 32, '737 claims 2, 4 and 7). Force is measured with a strain gage (instant claims 11 and 33, '737 claim 9). Although '737 claim 4 teaches automatically controlling and adjusting parameters, there is no disclosure of a program control system.

Zimmerman teaches a method of testing wire bond connections between a bonded wire and a pad on an electronic device formed in the conventional manner of heat or ultrasound wherein the method comprises lifting the bonding head after bond formation, gripping the wire with a clamp and raising the wire through a second distance during which process the force on the wire is detected (col 3 lines 1-46). The testing arrangement is integrated into the bonding head. The wire clamp holder is mounted to the bonding head such that it can be easily deflected against a pre-tensioning element. The bonding head comprises a tool holder, transducer holder, wire clamp holder, drive mechanism for vertical displacement of the bonding head and tool holder and a program control system for controlling movement and taking measurements (col 1 lines 24-34 and col 2 line 9 – col 3 line 46).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ a program control to automatically control measurements and adjustments in a reliable and consistent manner. Program control is a conventional method of automatically controlling devices and processes.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 8-10, 12-16, 18-21, 23, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Price et al. (USPN 5591920).

Price et al. teach a method of testing wire bond connections between a bonded wire and a pad on an electronic device (col 1 lines 36-40) formed in the conventional manner of heat or ultrasound, wherein the method comprises lifting the bonding head after bond formation, gripping the wire with a clamp (19) and raising the wire through a second distance during which process the force on the wire is detected (col 2 lines 25-40, col 3 lines 15-45 and col 4 lines 37-63). Distances and forces are calculated over time by a computer program (col 2 lines 33-40 and col 4 lines 1-36). The testing arrangement is integrated into the bonding head (figure 1). The bonding head comprises a tool holder, transducer holder, wire clamp holder, drive mechanism for vertical displacement of the bonding head and tool holder (col 3 lines 15-22) and a program control system for controlling movement and taking measurements (col 1 line 60 – col 2 line 3, col 5 lines 14-67 and col 8 lines 38-42). An intact state is detected during the process (col 4 lines 64-67). See also Price et al. claims 1-17.

5. Claims 4, 6-10, 21, 23, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Zimmerman (USPN 4786860).

Zimmerman teaches a method of testing wire bond connections between a bonded wire and a pad on an electronic device formed in the conventional manner of heat or ultrasound wherein the method comprises lifting the bonding head after bond formation, gripping the wire with a clamp and raising the wire through a second distance during which process the force on the wire is detected (col 3 lines 1-46). The testing arrangement is integrated into the bonding head. The wire clamp holder is mounted to the bonding head such that it can be easily deflected against a pre-tensioning element. The bonding head comprises a tool holder, transducer holder, wire clamp holder, drive mechanism for vertical displacement of the bonding head and tool holder and a program control system for controlling movement and taking measurements (col 1 lines 24-34 and col 2 line 9 – col 3 line 46).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 6, 7, 11, 27, 28, and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Price et al. (USPN 5591920) in view of Ringler (USPN 6439448) and Mayer (USPN 4895028).

Price et al. teach a method of testing wire bond connections between a bonded wire and a pad on an electronic device (col 1 lines 36-40) formed in the conventional manner of heat or ultrasound. Wherein the method comprises lifting the bonding head after bond formation, gripping the wire with a clamp (19) and raising the wire through a second distance during which process the force on the wire is detected (col 2 lines 25-40, col 3 lines 15-45 and col 4 lines 37-63). Distances and forces are calculated over time by a computer program (col 2 lines 33-40 and col 4 lines 1-36). The testing arrangement is integrated into the bonding head (figure 1). The bonding head comprises a tool holder, transducer holder, wire clamp holder, drive mechanism for vertical displacement of the bonding head and tool holder (col 3 lines 15-22) and a program control system for controlling movement and taking measurements (col 1 line 60 – col 2 line 3, col 5 lines 14-67 and col 8 lines 38-42). An intact state is detected during the process (col 4 lines 64-67). However, there is no disclosure of an elastically deflected clamp holder or of a strain gage or leaf spring.

Ringler teaches a method of testing wire bond connections between a bonded wire and a surface on an electronic device formed in the conventional manner of heat or ultrasound (col 1 lines 10-15). Wherein the method comprises lifting the bonding head after bond formation, gripping the wire with a clamp (60) and raising the wire through a second distance during which process the force on the wire is controlled (col 4 lines 44-

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59 and col 8 lines 3-32). The testing arrangement is integrated into the bonding head (figure 2). The bonding head comprises a tool holder, transducer holder, wire clamp holder, drive mechanism for vertical displacement of the bonding head and tool holder (figure 2 and col 4 lines 1-18) and a program control system for controlling movement (col 2 lines 19-33 and col 3 lines 5-10). The wire clamp holder is mounted to the bonding head such that it can be easily deflected against a pre-tensioning element (flexure, 50, 250) with a piezoelectric stack for force control (col 4 lines 44-53) and a leaf spring (col 8 lines 33-37).

Mayer teaches a strain gage for detecting force applied to a flexible element (col 2 lines 14-45 and col 2 line 60 – col 3 line 27).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ an elastically deflected holder to prevent damage to the tool and substrate and to employ a strain gage and a leaf spring to measure and control force in a simple and cost-effective manner.

8. Claims 11 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman (USPN 4786860) in view of Ringler (USPN 6439448 B1) and Mayer (USPN 4895028).

Zimmerman teaches a method of testing wire bond connections between a bonded wire and a pad on an electronic device formed in the conventional manner of heat or ultrasound wherein the method comprises lifting the bonding head after bond formation, gripping the wire with a clamp and raising the wire through a second distance

during which process the force on the wire is controlled (col 3 lines 1-46). The testing arrangement is integrated into the bonding head. The wire clamp holder is mounted to the bonding head such that it can be easily deflected against a pre-tensioning element. The bonding head comprises a tool holder, transducer holder, wire clamp holder, drive mechanism for vertical displacement of the bonding head and tool holder and a program control system for controlling movement and taking measurements (col 1 lines 24-34 and col 2 line 9 – col 3 line 46). However there is no disclosure of a strain gage or leaf spring.

Ringler teaches a method of testing wire bond connections between a bonded wire and a surface on an electronic device formed in the conventional manner of heat or ultrasound (col 1 lines 10-15). Wherein the method comprises lifting the bonding head after bond formation, gripping the wire with a clamp (60) and raising the wire through a second distance during which process the force on the wire is detected (col 4 lines 44-59 and col 8 lines 3-32). The testing arrangement is integrated into the bonding head (figure 2). The bonding head comprises a tool holder, transducer holder, wire clamp holder, drive mechanism for vertical displacement of the bonding head and tool holder (figure 2 and col 4 lines 1-18) and a program control system for controlling movement (col 2 lines 19-33 and col 3 lines 5-10). The wire clamp holder is mounted to the bonding head such that it can be easily deflected against a pre-tensioning element (flexure, 50, 250) with a piezoelectric stack for force control (col 4 lines 44-53) and a leaf spring (col 8 lines 33-37).

Mayer teaches a strain gage for detecting force applied to a flexible element (col 2 lines 14-45 and col 3 line 60 – col 3 line 27).

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ to employ a strain gage and a leaf spring to measure and control force in a simple and cost-effective manner when using an elastically deflected holder and thereby prevent damage to the tool and substrate.

Response to Arguments

9. The examiner acknowledges the applicant's response received by the USPTO on April 23, 2007. Although the applicant states that claims 9, 29, and 30 have been cancelled (see 1st paragraph on page 8 of remarks), it is noted that these claims remain under consideration. Overall, claims 1-4, 6-16, 18-21, 23, and 27-33 remain under consideration in the application.

10. Applicant's arguments filed April 23, 2007 have been fully considered but they are not persuasive.

With regard to the applicant's arguments on pages 8-13 of the response, it is noted that the applicant has argued the features set forth in above section 2 (double patenting), sections 4 and 5 (35 USC 102(b)), and sections 7 and 8 (35 USC 103(a)) without amendments to any of independent claims 1, 4, 12, and 21. The applicant is chiefly arguing the "force" limitations of the independent claims (in terms of "tensile" versus "compressive"). The examiner respectfully disagrees with this argument. During

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patent examination, the pending claims must be "given the broadest reasonable interpretation". Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969). Hence, based on the broadest reasonable interpretation of the applicant's broad limitations for and/or different interpretations of the "force" limitations, it is the examiner's position that the references of record, when taken alone or in combination, teach and/or suggest all of the claim limitations. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a direct tensile force measurement device) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding the double patenting rejections, although the examiner agrees that the Farassat reference teaches a "compressive" force in general, Zimmerman clearly discloses a tensile force and device for its measurement (see cited claims in Zimmerman in above section 2). In view of this combination of references in the double patenting rejections in above section 2, it is suggested that the applicant file a terminal disclaimer in the next response to overcome these double patenting rejections.

Regarding the 35 USC 102(b) rejections, it is noted that claim 2 of Price et al. teach a force detecting means that would be operable to perform the same process in

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the same manner (see column 6 lines 1-57, particularly lines 18-36, of Price et al., which teach determination of force in terms of a pull force, or tensile force). In addition, Price et al. (see column 1 lines 49-59 and lines 63-67) teach monitoring and adjustment of force to adjust bonding parameters. As a result, the 35 USC 102(b) rejections of claims 1-4, 8-10, 12-16, 18-21, 23, 29, and 30 as anticipated by Price et al. remain. Regarding applicant's argument that Zimmerman teaches a device for performing fault checks for missing wire rather than testing wire bond connections, it is noted that a missing wire would be an indication of a bad or missing connection. In response to applicant's argument that Zimmerman does not utilize force measurements for conversion into appropriate changes in bonding parameters, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Zimmerman teaches a wire bonding device with means for measuring force and making changes in the next step (increasing or decreasing current), as disclosed in column 4 lines 12-62, particularly lines 28-32 and lines 48-54. As a result, the 35 USC 102(b) rejections of claims 4, 6-8, 21, 23, 27, and 28 as anticipated by Zimmerman remain.

Regarding the 35 USC 103(a) rejections, the applicant's argument that Ringler does not teach force measurement remains unpersuasive, as it is noted that force measurement is taught in the primary references (Price et al. and/or Zimmerman). Ringler is not relied upon for this feature but rather for a bonding head that can be easily

deflected against a pre-tensioning element and leaf spring, as set forth in the dependent claims for which it is applied as a secondary reference. Regarding applicant's argument that Mayer does not teach a wire bonder but rather a pull tester, it is noted (as with Ringler) that the wire bonder is taught by Price et al. and/or Zimmerman. Mayer is not relied upon for the wire bonding portion of the structure but for the testing portion of the structure. Mayer teaches testing a wire bond using a strain gage to measure force. As a result, the 35 USC 103(a) rejections of claims 6, 7, 11, 27, 28, and 31-33 as obvious over Price and/or Zimmerman in view of Ringler and Mayer remain.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan Johnson can be reached on (571) 272-1177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin P. Kerns *Kevin Kerns 7/20/07*
Primary Examiner
Art Unit 1725

KPK
kpk
July 20, 2007